CLAIMS

What is claimed is:

1. A block synchronization detection apparatus in a system having a decoder that decodes an error correction code (ECC) in units of blocks comprising a plurality of sectors, the apparatus comprising:

an operator performing an operation on a predetermined last sector number, an n-th sector number, and an (n-1)-th sector number contained in a block, based on a predetermined operation relation; and

a comparator comparing a result of the operation output from the operator with a predetermined threshold value and outputting the result of the comparison as a block synchronization signal.

2. The apparatus of claim 1, wherein the comparator compares the result of the operation with the predetermined threshold value based on a comparison relation set depending on whether sector numbers contained in the block are sequentially increasing or decreasing.

3. The apparatus of claim 1, wherein if the sector numbers contained in the block are sequentially increasing, the comparator determines whether the result of the operation is smaller than a first predetermined threshold value, and if the sector numbers contained in the block are sequentially decreasing, the comparator determines whether the result of the operation is greater than a second predetermined threshold value.

4. The apparatus of claim 1, wherein the operation performed by the operator subtracts the (n-1)-th sector number from the predetermined last sector number, adds the n-th sector number to a result of the subtraction, and outputs a result of the addition.

5. The apparatus of claim 1, further comprising a delay unit that delays the (n-1)-th sector number for one sector duration before providing the (n-1)-th sector number to the operator.

6. The apparatus of claim 1, wherein the predetermined threshold value is set to determine block synchronization when errors occur in a plurality of the sector numbers.

7. The apparatus of claim 1, wherein the predetermined threshold value is set to determine block synchronization when a first sector number for the block is not detected.

8. A block synchronization detection apparatus in a system having a decoder that decodes an error correction code (ECC) in units of blocks having a plurality of sectors, the apparatus comprising:

a first block synchronization detection unit that, when sector numbers contained in a block are sequentially increasing, determines whether a result of an operation using a plurality of the sector numbers contained in the block is smaller than a first predetermined threshold value, and outputs a result of the determination as a block synchronization signal; and

a second block synchronization detection unit that, when the sector numbers contained in the block are sequentially decreasing, determines whether a result of an operation using a plurality of the sector numbers contained in the block is greater than a second predetermined threshold value, and outputs a result of the determination as a block synchronization signal.

9. The apparatus of claim 8, wherein the first and second predetermined threshold values are set to determine block synchronization when errors occur in a sector in which block synchronization is to be detected and in a plurality of the sector numbers adjacent to the sector in which block synchronization is to be detected.

10. The apparatus of claim 8, wherein the first and second predetermined threshold values are set to determine block synchronization when a first sector number for the block is not detected.

11. The apparatus of claim 8, further comprising a delay unit that delays input of one of the sector numbers for one sector duration.

12. The apparatus of claim 11, wherein the plurality of sector numbers contained in the block comprise an n-th sector number, a (n-1)-th sector number provided by the delay unit, and a predetermined last sector number of the block.

13. A block synchronization detection method in a system having a decoder that decodes an error correction code (ECC) in units of blocks having a plurality of sectors, the method comprising:

performing an operation on a predetermined last sector number, an n-th sector number, and an (n-1)-th sector number contained in a block;

setting a comparison relation between a result of the operation and a predetermined threshold value depending on whether sector numbers contained in the block are sequentially increasing or decreasing;

comparing a result of the operation with the predetermined threshold value according to the set comparison result; and

outputting a result of the comparison as a block synchronization signal.

14. The method of claim 13, wherein said performing an operation comprises subtracting the (n-1)-th sector number from the predetermined last sector number and adding the n-th sector number to a result of the subtraction.

15. The method of claim 13, wherein said setting a comparison relation comprises:

when the sector numbers are sequentially increasing, setting the comparison relation to compare whether the result of the operation is smaller than a first predetermined threshold value; and

when the sector numbers are sequentially decreasing, setting the comparison relation to compare whether the result of the operation is greater than a second predetermined threshold value.

16. The method of claim 15, wherein the first and second predetermined threshold values are different values.

17. The method of claim 13, wherein the first and second predetermined threshold values are set to determine block synchronization when errors occur in a sector in which block synchronization is to be detected and in a plurality of the sector numbers adjacent to the sector in which block synchronization is to be detected.

18. The method of claim 13, wherein the first and second predetermined threshold values are set to determine block synchronization when a first sector number for the block is not detected.

19. A block synchronization detection apparatus for a device having a decoder that decodes an error correction code (ECC) in units of blocks, each block having a plurality of sectors, the apparatus comprising:

a delay unit receiving an n-th sector number, delaying transmission of the n-th sector number for one sector duration, and outputting an (n-1)-th sector number;

a first block synchronization detection unit performing an operation using a last sector number, the n-th sector number, and the (n-1)-th sector number, and determining, when sector numbers contained in a block are sequentially increasing, whether a result of the operation is less than a first predetermined threshold value, and outputting a first result of the determination;

a second block synchronization detection unit performing the operation using the last sector number, the n-th sector number, and the (n-1)-th sector number, and determining, when the sector numbers contained in the block are sequentially decreasing, whether a result of the operation is greater than a second predetermined threshold value, and outputting a second result of the determination; and

a multiplexer receiving the first result and the second result and selectively transmitting the first result or the second result as a block synchronization signal depending on whether the sector numbers are increasing or decreasing.

20. The apparatus of claim 19, wherein the first and second predetermined threshold values are set to determine block synchronization when errors occur in a sector in which block synchronization is to be detected and in a plurality of the sector numbers adjacent to the sector in which block synchronization is to be detected.

21. The apparatus of claim 19, wherein the first and second predetermined threshold values are set to determine block synchronization when a first sector number for the block is not detected.

22. The apparatus of claim 19, wherein the first block synchronization detection unit comprises:

an operator performing the operation; and

a comparator comparing the result of the operation with the first predetermined threshold value.

23. The apparatus of claim 19, wherein the second block synchronization detection unit comprises:

an operator performing the operation; and

a comparator comparing the result of the operation with the second predetermined threshold value.

24. The apparatus of claim 22, wherein the operation performed by the operator subtracts the (n-1)-th sector number from the predetermined last sector number, adds the n-th sector number to a result of the subtraction, and outputs a result of the addition.

25. A block synchronization detection apparatus in a system having a decoder that decodes an error correction code (ECC) in units of blocks comprising a plurality of sectors, the apparatus comprising:

an operator performing an operation on a predetermined last sector number, an n-th sector number, and an (n-1)-th sector number contained in a block, based on a predetermined operation relation; and

a comparator comparing a result of the operation output from the operator with a predetermined threshold value and outputting the result of the comparison as a block synchronization signal, the block synchronization signal being used to discriminate one ECC block from another ECC block when a first sector of the one ECC block is not detected.